What is clamed is:

1. A method of generating feedback information in IQ form for linearity compensation of a communications transmitter using polar modulation and having an communications signal amplifier having an input signal and producing an output signal, comprising:

using the output signal, producing an output measurement signal;

using the input signal, producing an input measurement signal exhibiting varying phase and a substantially constant envelope;

shifting one of the output measurement signal and the input measurement signal by substantially 90 degrees to produce a quadrature measurement signal; and

mixing input measurement signals with output measurement signals to produce resulting in-phase and quadrature components, the in-phase and quadrature components representing a phase difference between the input measurement signal and the output measurement signal.

2. A method of generating feedback information in IQ form for linearity compensation of a communications transmitter using polar modulation, comprising:

using a polar modulator to produce a phase-modulated signal;

amplifying the phase-modulated signal to produce an output signal; and

using an IQ demodulator to produce feedback information for linearity compensation, the IQ modulator receiving as input signals the phase-modulated signal and the output signal, and producing as output signals in-phase and quadrature components representing a phase difference between the phase-modulated signal and the output signal.

3. A communications signal transmitter for transmitting a data signal, comprising:

a data modulator responsive to the data signal for producing modulated signal components including a magnitude component and a periodic signal containing a phase component;

an amplifier responsive to the magnitude component and the periodic signal for producing a desired communications signal; and

feedback circuitry responsive to the communications signal and to the periodic signal for producing feedback signal components in quadrature relation, the feedback signal components including information about a phase difference between the communications signal and the period signal.

4. The apparatus of claim 3, wherein the feedback circuit comprises:

first and second mixers;

a first pair of signals derived from the communications signal, a different one of the first pair of signals being applied to each of the mixers; and

a second pair of signals derived from the period signal, a different one of the second pair of signals being applied to each of the mixers;

wherein the signals of at least one the first pair of signals and the second pair of signals are in quadrature relation to one another.

5. The apparatus of claim 3, wherein the modulator further comprises:

a correction table for correcting the magnitude component and the phase component; and

adaptation means responsive to the feedback signal components for adapting values of the correction table.

6. The apparatus of claim 5, wherein the adaptation means is based on a statistical algorithm.

7. The apparatus of claim 6, wherein the statistical algorithm is the least mean squares algorithm.